DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
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> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 4, 5, 8, 9, 12, 13, 18, 19, 22, 26 and 27 are rejected under 35 U.S.C. 102(a) as being anticipated by Miklos et al. (2002/0181435).

As to claims 1, 9 and 12, Miklos teaches a system, apparatus and communication method for carrying out data communication among a plurality of communication stations, wherein:

upon a data transmission, a first communication station transmits a request to send signal for requesting transmission to other station, said request to send signal describing at least addresses of a plurality of second communication stations that are desired to receive the data when receiving the request to send signal transmitted from the first communication station (paragraphs 0009-0017; data initiated with a RTS and acknowledged with a CTS as in the IEEE 802.11 wireless LAN protocol, paragraphs 0084-0088; with a special broadcast bit in the RTS and CTS messages to signal that the frame is intended as a broadcast frame, the RTS is addressed to known other neighbors of the node),

each of said plurality of second communication stations transmits a clear to send signal notifying the completion of preparing the reception (paragraph 0088, each of the known addressed neighbor acknowledges the broadcast with a CTS if heard), and

said first communication station receives said plurality of clear to send signals transmitted from each of said plurality of second communication stations (paragraph 0088, the CTS is received and processed like the unicast transmissions)

As to claims 4, 18 and 26, with respect to claims 1, 13 and 22, Miklos teaches each of said plurality of second communication stations transmits the clear to send signals describing self address (paragraphs 0086-0088, CTS to acknowledge a broadcast RTS based on the remote client or second station's address).

As to claims 5, 19 and 27 with respect to claims 1, 13 and 22, Miklos teaches each said plurality of second communication stations time-divisionally transmits the clear to send signals (paragraph 0009, IEEE 802.11 wireless LAN protocol).

As to claim 8 with respect to claim 1, Miklos teaches each of said first communication station and said plurality of second communication stations is configured to carry out wireless communications (paragraph 0009, IEEE 802.11 wireless LAN protocol).

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As to claim 13 with respect to claim 12, Miklos teaches said communication means receives a plurality of clear to send signals transmitted from said plurality of communication stations which receives the request to send signal for notifying the completion of preparing the reception to the other communication station (paragraphs 0010 and 0088).

As to claim 22, Miklos teaches a communication apparatus for receiving data transmitted from other communication stations comprising:

Communication means for receiving a request to send signal requesting transmission to other communication station upon transmission of data by the communication station of a transmission side and describing at least addresses of a plurality of communication station requested to receive the data (paragraphs 0009-0017 and 0088, the remote client of a WLAN system recognizing its address in a RTS message in a broadcast from a transmitting node),

Data processing means for generating clear to send signal for notifying the completion of preparing the reception to the communication station of the transmission side (paragraph 0088, the remote client responding or acknowledging an RTS message with a CTS message in accordance with IEEE 802.11 RTS/CTS messaging as applied to a broadcast).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2, 3, 10, 11, 14-17 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miklos et al. (US 2002/0181435) in view of Lewis (US 2006/0079289).

As to claims 2, 10, 14 and 17, Miklos teaches the communication system of claims 1 and 9 but does not teach said first communication station has a plurality of antenna elements for a directive antenna.

Lewis teaches a wireless local area network where wireless signals are exchanged between at least one remote client and an access node comprising a directional antenna array that includes a plurality of antenna elements, figure 1, paragraph 0015. Lewis discloses each of said plurality of second communication stations transmit clear to send signal describing at least reference information known to said first communication station and said first communication station learns weightings for the directive antenna on the basis of the reference information in the clear to send signals transmitted from said plurality of second communication stations, figure 1, paragraphs 0014 and 0015. Lewis teaches a WLAN system to determine the values for the array weights used in the beamformer to create phase differences that allow the

steering of nulls towards interference sources and beams towards the desired clients, figures 1, 2a and 2b, paragraphs 0008 and 0015.

Since Lewis teaches a WLAN like Miklos, it would have been obvious to one of ordinary skill in the art to apply the directive antenna array and signal processing system of Lewis in the communication system of Miklos to avoid interference between wireless clients as the number of clients in a network increases.

As to claims 3, 11 and 16, Miklos teaches a first communication station transmits data by the space division multiplexing to each of said second communication stations *using antenna elements* when receiving the Clear to send signal transmitted from each of said plurality of second communication stations, (paragraph 0009, data transmission in accordance with the IEEE 802.11 wireless LAN protocol) and

each of said plurality of second communication stations transmits a response signal which is used to notify that the transmitted data to other stations is correctly received, describes at least second reference information known to said first communication station, and is inherent to said plurality of second communication stations when receiving the data transmitted from said first communication station (paragraphs 0009-0017 and 0088, data transmission is initiated by an RTS request/ clear to send (CTS) message exchange followed by the transmission of a full upper-layer packet).

Miklos does not teach the first communication station transmits data using a plurality of antenna elements.

Lewis teaches a wireless local area network where wireless signals are exchanged between at least one remote client or second communication station and an access node or first communication station comprising a directional antenna array that includes a plurality of antenna elements, figure 1, paragraph 0015.

Since Lewis teaches a WLAN like Miklos, it would have been obvious to one of ordinary skill in the art to apply the directive antenna array and signal processing system of Lewis in the communication system of Miklos to avoid interference between wireless clients as the number of clients in a network increases.

As to claim 15 with respect to claims 14, Lewis of Miklos modified teaches said data processing means (of a first communication station) obtains transfer functions between each of antenna elements of said plurality of second communication station and each of said plurality of antenna elements thereof on the basis of the reference information in the plurality of the clear to send signals transmitted from said plurality of second communication stations and learns the weightings for the directive antenna on the basis of the transfer functions (figure 1, paragraph 0008, a statistical matrix analysis is performed for each client and the antenna array to determine weighting factors for RF signals of each of the plurality of antenna elements).

As to claim 17 with respect to claim 16, Lewis of Miklos modified teaches the data processing means directly learns the weightings of the directive antenna on the basis of the second reference information included in the plurality of response signals

transmitted from each of the communication stations (paragraphs 0015-0016, the array weights are based on the direction of the received CTS message that identifies each client).

As to claim 23 with respect to claim 22, Miklos teaches the communication station of the transmission side includes data processing means to generate the clear to send signal describing at least a reference information known to the communication station of the transmission side (paragraphs 0084-0088, the identity for the RTS and CTS is based on the address of the remote client) but does not teach the communication station of the transmission side includes a plurality of antenna elements for a directive antenna and used for learning weightings for the direct information on the basis of the reference information by the communication station of the transmission side.

Lewis teaches a wireless local area network where wireless signals are exchanged between at least one remote client or second communication station and an access node or first communication station comprising a directional antenna array that includes a plurality of antenna elements, figure 1, paragraph 0015.

Since Lewis teaches a WLAN like Miklos, it would have been obvious to one of ordinary skill in the art to apply the directive antenna array and signal processing system of Lewis in the communication system of Miklos to avoid interference between wireless clients as the number of clients in a network increases.

As to claim 24 with respect to claim 23, Lewis of Miklos modified teaches the data processing means (of the remote client) generates a clear to send signal describing at least the reference information capable of obtaining transfer functions between antenna elements of itself and the plurality of antenna elements of the communication station of the transmission side (figure 1, paragraphs 0015 and 0016, the CTS generated by the remote client is used by the transmission side or WLAN node to determine the values for the array weights used in the beamformer).

As to claim 25 with respect to claim 23, Lewis of Miklos modified teaches said data processing means (of the remote client), when receiving the data transmitted from the communication station of the transmission side using a plurality of antenna elements by the space division multiplexing, generates a response signal known to the communication station of the transmission side for notifying the correct reception of transmitted data to the other communication station, and for describing at least a second reference signal used for directly learning the weightings of the directive antenna by the communication station of the transmission side; and said communication means transmits the response signal (figure 1, paragraphs 0015 and 0016, the CTS acknowledgement message generated by the remote client is used by the transmission side or WLAN node to determine the values for the array weights used in the beamformer to create phase differences that allow the steering of nulls towards interference sources and beams towards the desired clients).

Allowable Subject Matter

Claims 6, 7, 20, 21, 28 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Reference the PTO-1449 document for the prior art made of record and not relied upon but considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blane J. Jackson whose telephone number is (571) 272-7890. The examiner can normally be reached on Monday through Thursday, 8:30 AM-7:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Blane J Jackson/
Primary Examiner, Art Unit 2618